Application No.: <u>10/074,747</u>
Attorney Docket No.: <u>MP0096</u>

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	) Examiner: Joseph D. TORRES
	)
Pantas SUTARDJA, et al.	) Group Art Unit: 2133
	)
Application No.: 10/074,747	) Appeal No. _____
	)
Filed: February 11, 2002	) Confirmation No.: 9964
	)
For: ENCODING AND DECODING	)
APPARATUS AND METHOD	)
WITH HAMMING WEIGHT	) Date: November 7, 2005
ENHANCEMENT	)

REPLY BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The present Reply Brief is being filed in response to the Examiner's Answer mailed September 7, 2005.

Summary of Arguments

For the convenience of the Board, a summary of Appellants' arguments in reply to the Answer is provided below. The following arguments are discussed in greater detail in the following sections.

With respect to the grouping of claims, Appellants respectfully note that the Appeal Brief is in conformance with the mandates of 37 C.F.R. § 41.37, as the claims argued as groups are placed under subheadings identifying the claims by number. Therefore, it is

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respectfully submitted that the Patent Office's statement that all of the appealed claims stand or fall together is incorrect.

With regard to the rejections under 35 U.S.C. § 112, first and second paragraphs, Appellants respectfully submit that the Patent Office is not following the requirements and principles for proper examination of the claims under the first and second paragraphs of 35 U.S.C. § 112. For example, in their Appeal Brief, Appellants are merely pointing the Patent Office to specific sections of the present application that should be referenced by the Patent Office to interpret the claims in light of the disclosure, as required by a proper analysis under 35 U.S.C. § 112, second paragraph.

With regard to the rejections under 35 U.S.C. § 101, it is respectfully submitted that the Patent Office has failed to apply the correct test for utility required under 35 U.S.C. § 101, i.e., the practical application test set forth in *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 47 U.S.P.Q.2d 1596 (Fed. Cir. 1998). Rather, by stating that the present claims recite "an abstract algorithm carried out by hand," the Patent Office is clearly using the "human step" test to determine whether the claims of the present application are directed to statutory subject matter, which is a test that is no longer applied by the Patent Office.

With regard to the rejections under 35 U.S.C. § 102(e) to U.S. Patent No. 6,456,208 to Nazari et al. (hereinafter "Nazari"), it is respectfully submitted that the Patent Office has mischaracterized the comparison performed by the Nazari invention. In particular, Nazari teaches that the <u>bit patterns</u> of bits comprising subgroups of a code word are compared with <u>bit patterns</u> in a table. In contrast, exemplary embodiments compare the <u>characteristic Hamming weight</u> of the initial binary data with a predetermined value, and then process the initial binary data <u>based on the comparison</u> (between the <u>characteristic Hamming weight</u> of the initial binary data and the predetermined value) to thereby develop processed binary data having a Hamming weight not less than the characteristic Hamming weight of the initial binary data.

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Grouping of Claims

In Section 7, page 2 of the Answer, the Patent Office states all of the appealed claims "stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof." [Answer, page 2, section 7]

Appellants respectfully note that under (revised) 37 C.F.R. § 41.37, an express statement of grouping of claims is no longer required. In particular, in the "argument" section of the Appeal Brief,

> [f]or each ground of rejection applying to two or more claims, the claims may be argued separately or as a group. When multiple claims subject to the same ground of rejection are argued as a group by appellant, the Board may select a single claim from the group of claims that are argued together to decide the appeal with respect to the group of claims as to the ground of rejection on the basis of the selected claim alone. . . . Any claim argued separately should be placed under a subheading identifying the claim by number. <u>Claims argued as a group should be placed under a subheading identifying the claims by number.</u> [37 C.F.R. § 41.37(c)(vii) (emphasis added)]

Thus, instead of an express statement, all that is now required is that the claims argued as a group be placed under a subheading identifying the claims by number. Appellants respectfully note that for multiple claims subject to the same ground of rejection, each group of claims argued separately has been placed under a subheading in the Appeal Brief, in compliance with the requirements of 37 C.F.R. § 41.37. Such compliance can be seen from, for example, the table of contents of Appellants' Appeal Brief.

In particular, for the rejection of Claims 1-10, 24-33, 38-47, 65-74, 88-97, 102-111, 118-137, 155-164, and 171-180 under 35 U.S.C. § 112, second paragraph, as allegedly being incomplete for omitting essential elements, the claims are placed under subheadings as follows: Claims 1, 38, 118, 128, 171; Claims 1, 24, 38, 65, 88, 102, 118, 128, 155, 171; Claims 10, 33, 47, 74, 97, 111, 127, 137, 164, 180; Claims 65, 88; and Claims 102, 155.

For the rejection of Claims 1-10, 24-33, 38-47, 65-74, 88-97, 102-111, 118-137, 155-164, and 171-180 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for

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failing to particularly point out and distinctly claim the subject matter which the Appellants regard as the invention, the claims are placed under subheadings as follows: Claims 1, 24, 38, 65, 88, 102, 118, 128, 155, 171; and Claims 65, 88.

For the rejection of Claims 1-10, 24-33, 38-47, 65-74, 88-97, 102-111, 118-137, 155-164, and 171-180 under 35 U.S.C. § 101, because the claimed invention is allegedly directed to non-statutory subject matter, the claims are placed under subheadings as follows: Claims 1-10, 118-137, 155-164; and Claims 65-74, 88-97.

For the rejection of Claims 1-10, 24-33, 38-47, 65-74, 88-97, 102-111, 118-137, 155-164, and 171-180 under 35 U.S.C. § 102(e), as allegedly being anticipated by Nazari, the claims are placed under subheadings as follows: Claims 1-3, 24-26, 38-40, 65-67, 88-90, 102-104, 118-120, 155-157, 171-173; Claims 4, 27, 41, 68, 91, 105, 121, 131, 158, 174; Claims 5, 28, 42, 69, 92, 106, 122, 132, 159, 175; Claims 6, 29, 43, 70, 93, 107, 123, 133, 160, 176; Claims 7, 30, 44, 71, 94, 108, 124, 134, 161, 177; Claims 8, 31, 45, 72, 95, 109, 125, 135, 162, 178; Claims 9, 32, 46, 73, 96, 110, 126, 136, 162, 179; and Claims 10, 33, 47, 74, 97, 111, 127, 137, 163, and 180.

As Appellants' Appeal Brief is in conformance with the mandates of 37 C.F.R. § 41.37, it is respectfully submitted that the Patent Office's statement that all of the appealed claims stand or fall together is incorrect.

Grounds of Rejection

I. Introduction

In the introduction to the Answer, the Patent Office attempts to "clarify" the terminology used in the claims of the present application to "clarify" the scope of the claim language of the claims on appeal. [*see* Answer, pages 3-4 and 42-44] To perform such "clarification," it is respectfully noted that the Patent Office has rewritten claim 1 of the present application at its discretion to re-characterize the claim in a manner fitting for the Patent Office. For example, claim 1 recites the feature of "obtaining initial binary data

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having a characteristic Hamming weight." The Patent Office rewrites such feature as "obtaining initial binary data," asserting that the clause "having a characteristic Hamming weight" is "inherent." [*see* Answer, pages 3 and 43] Appellants acknowledge that it is inherent that "binary data" has "a characteristic Hamming weight." However, Appellants respectfully submit that the Patent Office is ignoring the subsequent steps that use the characteristic Hamming weight – which are not inherent steps. For example, it is respectfully submitted that the Patent Office is ignoring the steps of <u>determining</u> the characteristic Hamming weight of the initial binary data, <u>comparing</u> the characteristic Hamming weight of the initial binary data with a predetermined value, and <u>processing</u> the initial binary data based on the comparison to thereby develop processed binary data having a Hamming weight not less than the characteristic Hamming weight of the initial binary data, as recited in, for example, independent claim 1 of the present application.

In performing this and other rewrites, the Patent Office has violated numerous mandates of claim construction principles, not the least of which are the casual ignoring or wholesale elimination of features recited in the claims, the reading of limitations of the specification into the claims, as well as other like violations of claim construction principles. Appellants strongly object to the Patent Office's construction of claim 1 as being improper, unwarranted, and in complete derogation of the principles and mandates of the patent laws, particularly those regarding interpretation and construction of claims and the terminology therein. If such an interpretation is to be maintained, Appellants respectfully request that the Patent Office provided legal support for the Patent Office's supposed claim construction principles and the legal basis for rewriting claim 1 of the present application in the manner proffered by the Patent Office.

II.   Rejections Under 35 U.S.C. § 112. First and Second Paragraphs

With regard to the rejections under 35 U.S.C. § 112, first and second paragraphs, the Patent Office contends that the Appellants are attempting to read limitations from the specification into the claims. [*see, e.g.,* Answer, pages 6, 8, 10, 45, 47 and 48] Appellants

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respectfully submit that no such attempt is being made to read limitations from the specification into the claims. Rather, Appellants are attempting to point out to the Patent Office the requirements and principles for proper examination of the claims under the first and second paragraphs of 35 U.S.C. § 112 that Appellants assert the Patent Office are not following.

As an initial matter, Appellants note that the Patent Office is relying on the interpretation of claim 1 that was proffered in the introduction to the Answer in rebutting Appellants arguments regarding the 35 U.S.C. § 112, first and second paragraph rejections. [*see* Answer, pages 6-7 and 45-46] Appellants strongly object to the Patent Office's construction of claim 1 as being improper, unwarranted, and in complete derogation of the principles and mandates of the patent laws, particularly those regarding interpretation and construction of claims and the terminology therein.

Furthermore, with respect to the rejection of claims 1-10, 38-47, 118-137 and 171-180 under 35 U.S.C. § 112, second paragraph, for allegedly omitting essential elements, according to M.P.E.P. § 2106,

> Applicant's claims, interpreted in light of the disclosure, must reasonably apprise a person of ordinary skill in the art of the invention. However, the applicant need not explicitly recite in the claims every feature of the invention. For example, if an applicant indicates that the invention is a particular computer, the claims do not have to recite every element or feature of the computer. In fact, it is preferable for claims to be drafted in a form that emphasizes what the applicant has invented (i.e., what is new rather than old). [M.P.E.P. § 2106 (citations omitted) (emphasis added)]

It is respectfully submit that the Appellants have recited claims that emphasize what the Appellants have invented. In the Appeal Brief, Appellants are not attempting to read limitations from the specification into the claims. Instead, Appellants have pointed to specific sections of the present application that should be referenced by the Patent Office to interpret the claims in light of the disclosure, as required by a proper analysis under 35 U.S.C. § 112, second paragraph. [*see* Appeal Brief, page 20] If the Patent Office would review these sections of the present application, it is Appellants contention that the Patent Office would understand that a skilled artisan would recognize "how the limitations in the

body of the claim are related to the communication encoding" when the claims are read in light of the disclosure. Accordingly, Appellants assert that the claims 1-10, 38-47, 118-137 and 171-180 of the present application "reasonably apprise a person of ordinary skill in the art of the invention.'" In particular, it is respectfully submitted that claims 1-10, 38-47, 118-137 and 171-180 do not omit any essential element or step. Rather, it is respectfully submitted again that the Patent Office is misunderstanding, misinterpreting and mischaracterizing both the aforementioned claims and the tenets and requirements of the patent laws.

Additionally, Appellants respectfully note that "the applicant need not explicitly recite in the claims every feature of the invention. For example, if an applicant indicates that the invention is a particular computer, the claims do not have to recite every element or feature of the computer. In fact, it is preferable for claims to be drafted in a form that emphasizes what the applicant has invented (i.e., what is new rather than old)." [M.P.E.P. § 2106 (citations omitted)] It is respectfully submitted that the Appellants have recited claims that emphasize that which has been invented. To require the Appellants to recite each and every step or element in the entire encoding process would require Appellants to recite in the claims that which is old. No such requirement exists under the patent laws, and the Patent Office has still not provided any support or basis for its untenable position. In particular, the Appellants have respectfully requested that the Patent Office point out the precise law and/or rule, the exact section of the M.P.E.P., as well as the sentences within that section relied upon to support the Patent Office's unfounded requirement. It is respectfully noted that such request has still not been honored by the Patent Office, as the Patent Office merely baldly reiterates that "the Examiner does not see any connection that the body of claim 1 may have with communication systems or encoding." [Answer, page 7]

Furthermore, with regard to the rejection of claims 1, 24, 38, 65, 88, 102, 118, 128, 155 and 171 under 35 U.S.C. § 112, second paragraph, as allegedly omitting essential elements, because the term "based on" is supposedly indefinite, the Patent Office asserts that the Appellants are somehow attempting to read limitations from the specification into the claims. Appellants again reiterate that according to M.P.E.P. § 2173.02, "the test for

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definiteness under 35 U.S.C. § 112, second paragraph, is whether 'those skilled in the art would understand what is claimed <u>when the claim is read in light of the specification.'''</u> [M.P.E.P. § 2173.02 (citations omitted) (emphasis added)] If one skilled in the art is able to ascertain the meaning of the terms used in the claim in light of the specification, 35 U.S.C. § 112, second paragraph, is satisfied. [*see* M.P.E.P. § 2173.02] Appellants are merely pointing the Patent Office to specific sections of the present application that should be referenced by the Patent Office to interpret the claims in light of the disclosure, as required by a proper analysis under 35 U.S.C. § 112, second paragraph. [*see* Appeal Brief, page 24] If the Patent Office would review these sections of the present application, it is Appellants' contention that the Patent Office would understand that a skilled artisan "would understand what is claimed when the claim is read in light of the specification."

Appellants also take issue with the Patent Office's statement in the Answer that "the Applicant has not provided any interpretation in the specification to support the Applicant's claim 'sections of the specification support and provide a relationship between 'the processing and comparison.' The Appellant is merely pleading, unsupported by proof or a showing of facts." [Answer, pages 9 and 48] Appellants contend that the Patent Office is mistaken that the Appellants are "merely pleading," and direct the Patent Office's attention to, for example, page 24 of the Appeal Brief, which clearly cites **an entire paragraph** of the specification of the present application (i.e., page 19, paragraph 0047) to support Appellants contentions. Appellants respectfully note that other sections of the present application were further cited in support of Appellants' arguments, which the Patent Office has also apparently missed. [*see* Appeal Brief, page 25]

With regard to the rejection of claims 10, 33, 47, 74, 97, 111, 127, 137, 164 and 180 under 35 U.S.C. § 112, second paragraph, the Patent Office re-asserts that the phrase "wherein a symbol boundary of an encoded symbol does not change relative to error correction encoding" allegedly omits essential elements or steps, particularly "how a symbol boundary relates to any of the other data structures such as 'initial binary data.'" [Answer, pages 9 and 48] The Patent Office also re-asserts that the term "does not change relative" is indefinite. [*see* Answer, pages 9 and 48] Again, the Patent Office alleges that Appellants are

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attempting to read limitations from the specification into the claims. [*see* Answer, page 10]

In the Appeal Brief, Appellants are not attempting to read limitations from the specification into the claims. Instead, Appellants have pointed to specific sections of the present application that should be referenced by the Patent Office to interpret the claims in light of the disclosure, as required by a proper analysis under 35 U.S.C. § 112, second paragraph. [*see* Appeal Brief, page 20]

In particular, for example, dependent claim 9, which depends from independent claim 1, recites the step of "processing the initial binary data comprises performing at least one of error correction coding, run-length encoding, and precoding." Thus, the step of processing the initial binary data to develop processed binary data can include one or more of the steps of error correction coding, run-length encoding, and precoding. Dependent claim 10, which depends from claim 9, recites that "a symbol boundary of an encoded symbol does not change relative to error correction coding." According to an exemplary embodiment of the present invention, "the symbol boundary of an encoded symbol advantageously may be left unchanged relative to the error correction coding." [present application, page 18, paragraph 0043] Thus, according to one exemplary embodiment, the error correction coding does not change the symbol boundary of an encoded symbol.

Based on the foregoing, it is respectfully submitted that a skilled artisan would recognize "how a symbol boundary relates to any of the other data structures such as 'initial binary data'" when the claim is read in light of the specification. In particular, a skilled artisan would recognize that the symbol boundary recited in claim 10 refers to an encoded symbol, not initial binary data as asserted by the Patent Office, because the initial binary data is processed by one or more of the steps of error correction coding, run-length encoding and pre-coding as recited in dependent claim 9. It is simply Appellants contention that if the Patent Office would review these claims and the appropriate sections of the present application based on a proper analysis under 35 U.S.C. § 112, second paragraph, Appellants believe that the Patent Office would realize that since the "scope of the subject matter embraced by the claims is clear, and . . . applicants have not otherwise indicated that they

intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. § 112, second paragraph." [M.P.E.P. § 2173.04]

Additionally, Appellants take issue with the Patent Office's statement that "[t]he language [of claim 10] is just plain undecipherable and would always require a translator and unless the Appellant is going to make himself available to translate the phrase every time someone should come across the phrase, the Examiner suggest [sic] that the Applicant rewrite the claim." [Answer, pages 10 and 49] First, Appellants respectfully note that such a statement is inappropriate, and does not accord the respect and civility that is due to the Appellants in this proceeding and for which Appellants have shown to the Patent Office throughout the present prosecution. Second, such a statement unequivocally indicates that the Patent Office is indeed utterly failing to read the claims in light of the specification. The Patent Office appears to be reading the claims "in a vacuum," devoid of the teachings of the specification, in complete derogation of the duties of the Patent Office in performing a proper analysis under 35 U.S.C. § 112, second paragraph.

In addition, Appellants respectfully note to the Board that numerous additional arguments were made in the Appeal Brief in response to other 35 U.S.C. § 112, first and second paragraph rejections proffered by the Patent Office. [*see* Appeal Brief, pages 28-38] However, instead of replying to each and every argument, the Patent Office merely reiterates the verbiage of these rejections of the claims. [*see* Answer, pages 10-12] Appellants respectfully contend that merely reiterating the wording of these rejections of the claims does not suffice to rebut or otherwise answer Appellants (unanswered) arguments in the Appeal Brief.

For at least the foregoing reasons, Appellants respectfully submit that the specification and claims of the present application are in full and complete compliance with the mandates of 35 U.S.C. § 112, first and second paragraphs.

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III.   Rejections Under 35 U.S.C. § 101

With regard to the rejection of claims 1-10, 38-47, 65-74, 88-97, 102-111, 118-137, 155-164 and 171-180 under 35 U.S.C. § 101, the Patent Office alleges that the aforementioned claims recite "an abstract algorithm that can be carried out by hand with no link to any tangible process, machine, manufacture, or composition of matter." [Answer, page 13] It is respectfully submitted that the Patent Office has clearly and unequivocally failed to apply the correct test for utility required under 35 U.S.C. § 101.

Appellants note that on October 26, 2005, the Patent Office issued "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (hereinafter, the "Guidelines"). These Guidelines "set forth the procedures USPTO personnel will follow when examining applications." [Guidelines, page 2] Annex III of the Guidelines discusses improper tests for subject matter eligibility. In particular, "the following tests are **not** to be applied by examiners in determining whether the claimed invention is patent eligible subject matter: . . . (C) mental step or human step tests . . . ." [Guidelines, page 42 (emphasis in original)] According to the Guidelines,

> [i]t is immaterial whether the process may be performed by some or all steps that are carried out by a human. Claims are not directed to non-statutory processes merely because **some or all** the steps therein can also be carried out in or with the aid of a human or because it may be necessary for one performing the processes to do some or all of the process steps. The inclusion in a patent of a process that may be performed by a person is not fatal to patentability . . . . Therefore, USPTO personnel should no longer rely on the human step test to determine whether a claimed invention is directed to statutory subject matter. [Guidelines, page 47 (citations omitted) (emphasis in original)]

Thus, by stating that the present claims recite "an abstract algorithm carried out by hand," the Patent Office is clearly using the "human step" test to determine whether the claims of the present application are directed to statutory subject matter, in complete derogation of the prohibition against using such a test.

Rather, the proper test for determining whether claims are directed to statutory subject matter is whether the claimed process produces a useful, tangible and concrete result, i.e.,

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apply the practical application test set forth in *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 47 U.S.P.Q.2d 1596 (Fed. Cir. 1998). The attention of the Patent Office is directed to pages 19-22 of the Guidelines, which discusses proper application of the appropriate tests under 35 U.S.C. § 101.

In particular, according to M.P.E.P. § 2106, "[t]he claimed invention as a whole must accomplish a practical application. That is, it must produce a 'useful, concrete and tangible result.'" [M.P.E.P. § 2106 (citations omitted)] Although the courts have yet to define the terms "useful," "concrete," and "tangible" in the context of the practical application requirement, several examples are given in the M.P.E.P. that illustrate claimed inventions that have a practical application, because they produce useful, concrete and tangible results. For example,

> transformation of data, representing discrete dollar amounts, by a machine through <u>a series of mathematical calculations</u> into a final share price, constitutes <u>a practical application of a mathematical algorithm, formula, or calculation,</u> because it produces "a useful, concrete and tangible result" – a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades. [M.P.E.P. § 2106 (citing *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 149 F.3d 1368 at 1373, 47 U.S.P.Q.2d 1596 at 1601 (Fed. Cir. 1998)) (emphasis added)]

In particular, a statutory process claim is illustrated as follows:

> [a] digital filtering process for removing noise from a digital signal comprising the steps of <u>calculating a mathematical algorithm to produce a correction signal</u> and subtracting the correction signal from the digital signal to remove the noise. [M.P.E.P. § 2106 (emphasis added)]

For example, claim 1 of the present application recites, among other features, a communication encoding method that includes the steps of: obtaining initial binary data having a characteristic Hamming weight; determining the characteristic Hamming weight of the initial binary data; performing a comparison of the characteristic Hamming weight of the initial binary data with a predetermined value; and processing the initial binary data based on the comparison <u>to thereby develop processed binary data</u> having a Hamming weight not less

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than the characteristic Hamming weight of the initial binary data. Thus, just as in the digital filtering process example illustrated above, it is respectfully submitted that claim 1 produces a "useful, concrete and tangible result" in the processed binary data having a Hamming weight not less than the characteristic Hamming weight of the initial binary data. As discussed in the present application, "the present invention employs an enhancement to the Hamming weight of data prior to encoding to increase the effectiveness of the ECC and RLL encoding processes." [present application, page 9, paragraph 0019] While such a "useful, concrete and tangible result" can be used in "general purpose computers (e.g., in disk drives, printers, routers, etc.), it is to be understood that the present invention may also find applicability in other noisy channels (e.g., wireless, etc.) and even in other fields such as Internet communications, telecommunications, or any processor-to-processor applications." [present application, page 21 – page 22, paragraph 0053] Therefore, following the appropriate test under *State Street*, as mandated by the Patent Office in the Guidelines, it is respectfully submitted that independent claims 1-10, 38-47, 65-74, 88-97, 102-111, 118-137, 155-164 and 171-180 define statutory subject matter. It is respectfully submitted that the Patent Office has not even attempted to undertake such an analysis, as mandated by the Guidelines.

Additionally, it is noted that according to M.P.E.P. § 2106, "[i]f a claim defines a useful machine . . . by identifying the physical structure of the machine . . . in terms of its hardware or hardware and software combination, it defines a statutory product. [M.P.E.P. § 2106 (citations omitted) (emphasis added)] For example, it is respectfully noted that claim 38 of the present application recites a communication encoding apparatus including a data input for receiving initial binary data having a characteristic Hamming weight. The apparatus also includes a processor in communication with the data input for determining the characteristic Hamming weight of the initial binary data, performing a comparison of the characteristic Hamming weight of the initial binary data with a predetermined value, and processing the initial binary data based on the comparison to thereby develop processed binary data having a Hamming weight not less than the characteristic Hamming weight of the

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initial binary data. Thus, not only is a "useful, concrete and tangible result" produced by the apparatus, but claim 38 also identifies the physical structure of the machine.

However, in response to Appellants' argument, the Patent Office relies on a dictionary definition of "processor" to state that "the term 'processor' does not cure the problem." [Answer, page 13] It is respectfully submitted that the Patent Office's reliance on an extrinsic dictionary to interpret the claims, instead of relying upon the intrinsic teachings of the specification of the present application, is in derogation of the mandates of claim interpretation. In *Phillips v. AWH Corp.*, 75 U.S.P.Q.2d 1321 (CA FC 2005), the Federal Circuit held that the methodology of claim interpretation in which the specification is consulted only <u>after</u> ordinary meaning or meanings of disputed claim terms is derived from a dictionary, treatise, or other source is **not** a proper approach to claim construction. Such an approach improperly restricts the role of the specification, which is "the single best guide to the meaning of a disputed term." *Phillips*, 75 U.S.P.Q.2d at 1332. Elevating the dictionary meaning to such prominence improperly focuses inquiry on abstract meaning of words, rather than on the meaning of the claim terms within context of the patent. *Phillips*, 75 U.S.P.Q.2d at 1332-1335. Therefore, it is respectfully submitted that the Patent Office's reliance on the dictionary definition of "processor" is misplaced, misguided, and wholly improper, given the specific teachings of the specification of the present application.

With regard to claims 65-74 and 88-97, each of independent claims 65 and 88 recites a computer-readable medium "having stored thereon" executable instructions for performing the communication encoding method according to exemplary embodiments. The Patent Office characterizes these claims as directed to "nonfunctional descriptive material." It is respectfully submitted that the Patent Office appears to be confusing "nonfunctional" and "functional" descriptive material. According to the Guidelines, "nonfunctional descriptive material" includes "music, literary works, and a compilation or mere arrangement of data." [Guidelines, page 50] However, "functional descriptive material" includes "data structures and computer programs which impart functionality when employed as a computer component." [Guidelines, page 50] As the Guidelines state, "[w]hen functional descriptive material is recorded on some computer-readable medium it becomes structurally and

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functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized." [Guidelines, page 50; *see also* M.P.E.P. § 2106 (citing *In re Lowry*, 32 F.3d 1579, 1583-84, 32 U.S.P.Q.2d 1031, 1035 (Fed. Cir. 1994) (<u>claim to data structure stored on a computer readable medium that increases computer efficiency held statutory</u>)] In other words, " a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory." [M.P.E.P. § 2106]

It is respectfully submitted that independent claims 65 and 88 do not recite "music," "literary works," or "a compilation or mere arrangement of data." Rather, these claims recite sets of machine-executable instructions that obtain initial binary data having a characteristic Hamming weight, determines the characteristic Hamming weight of the initial binary data, performs a comparison of the characteristic Hamming weight of the initial binary data with a predetermined value, and processes the initial binary data based on the comparison to thereby develop processed binary data having a Hamming weight not less than the characteristic Hamming weight of the initial binary data. As such, these claims recite "computer programs which impart functionality when employed as a computer component," and are, therefore, functional descriptive material. The Patent Office cites to *In re Warmerdam*, 31 U.S.P.Q.2d 1031 (Fed. Cir. 1994), for the proposition that a "claim to a data structure per se held nonstatutory."[1] However, as the foregoing discussion amply indicates, comparing these claims to the mere recitation of a data structure per se is incorrect, and evinces a clear misunderstanding on the part of the Patent Office of the difference between "functional" and "nonfunctional" descriptive material and of the subject matter of these claims.

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1   Appellants note that the Patent Office highlights, in bold and underlined, the proposition from *Warmerdam* that "claim to computer having a specific data structure stored in memory held <u>statutory</u> product-by-process claim." [*see* Answer, page 14 and page 51 (emphasis added)] Appellants respectfully note that the Patent Office is (at least inadvertently) indicating that the claims-at-issue may be statutory. At the very least, however, Appellants believe that the highlighted section further indicates the confusion exhibited on the part of the Patent Office with regard to the difference between "functional" and "nonfunctional" descriptive language.

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The Patent Office also states that a "computer program is non-statutory." [Answer, pages 15 and 53] As the Guidelines indicate, "computer programs claimed as computer listings per se" are not statutory. [*see* Guidelines, page 53] However, "a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory." [Guidelines, page 53 (citing *In re Lowry*, 32 U.S.P.Q.2d at 1035)] It is noted that independent claims 65 and 88 recite a computer-readable medium "having stored thereon" executable instructions for performing the communication encoding method according to exemplary embodiments. Again, as the foregoing discussion illustrates, the Patent Office's statement that a "computer program is non-statutory" simply ignores the language of the claims and the established principles of the patent laws, for example, as discussed in the Patent Office's own Guidelines on the topic.

Appellants also note that the Patent Office is again relying on the interpretation of claim 1 that was proffered in the introduction to the Answer to interpret claim 65 in rebutting Appellants arguments regarding the 35 U.S.C. § 101 rejections. [*see* Answer, pages 15 and 51-52] Again, Appellants strongly object to the Patent Office's construction of claim 65 as being improper, unwarranted, and in complete derogation of the principles and mandates of the patent laws, particularly those regarding interpretation and construction of claims and the terminology therein.

With regard to claims 102, 118, 128, 155 and 171, the Patent Office alleges that these claims recite "an abstract algorithm that can be carried out by hand with no link to any tangible process, machine, manufacture, or composition of matter." [Answer, pages, 15-17] As discussed previously, by stating that the present claims recite "an abstract algorithm carried out by hand," the Patent Office is clearly using the "human step" test to determine whether the claims of the present application are directed to statutory subject matter, in complete derogation of the prohibition against using such a test. It is additionally noted that the Patent Office is again relying on an extrinsic dictionary definition of "processor" to interpret these claims, instead of relying upon the intrinsic teachings of the specification of

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the present application, in derogation of the mandates of claim interpretation as indicated by the Federal Circuit in *Phillips*.

For at least the foregoing reasons, Appellants respectfully submit that the claims of the present application define statutory subject matter in full and complete compliance with the mandates of 35 U.S.C. § 101.

IV.   Rejections Under 35 U.S.C. § 102(e)

With regard to the rejection of claims 1-3, 24-26, 38-40, 65-67, 88-90, 102-104, 118-120, 155-157 and 171-173, the Patent Office carries out many pages of hand calculations in the Answer in an attempt to illustrate that Nazari allegedly teaches the features of, for example, independent claims 1, 24, 38, 65, 88, 102, 118, 128, 155 and 171. [*see* Answer, pages 20-38 and 55-73] Appellants note with appreciation the mathematical prowess of the Patent Office in illustrating its point. However, even with such prodigious mathematical calculations, it is respectfully submitted that the Patent Office has still failed to show that Nazari teaches the features of, for example, determining the characteristic Hamming weight of the initial binary data, performing a comparison of the <u>characteristic Hamming weight</u> of the initial binary data with a predetermined value, and processing the initial binary data <u>based on the comparison</u> to thereby develop processed binary data having a Hamming weight not less than the characteristic Hamming weight of the initial binary data, as recited in, for example, independent claim 1 of the present application.

Appellants respectfully note that they do not necessarily agree with the Patent Office's analysis of Nazari. Accordingly, Appellants are merely responding to the Patent Office's characterizations of Nazari. As previously discussed in the Appeal Brief, as understood by Appellant, Nazari teaches that a thirty-two bit input code word is subdivided into four eight-bit interleaves: {intLO, intLE, intRO, intRE}. [*see* Nazari, column 5, lines 47-56] Each interleave is compared to Table A, illustrated in Figure 2, to determine if a violation of the coding rules exists. [*see* Nazari, column 5, lines 56-58] "Once a violation is

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found the position of the 'bad' eight bit word in Table A is used to point to a four bit replacement in Table B." [Nazari, column 5, lines 58-60] As disclosed by Nazari,

> [f]or the right interleaves, intRO, and intRE, the data in the interleaves are directly compared to the eight bit words in Table A, and the four bit word pointed to in Table B is reversed and place into the appropriate right interleave in the output code word OUT. For the left interleaves, intLO and intLE, the data in the interleaves is reversed and compared to the 'bad' eight bit words in Table A and the four bit word pointed to in TABLE B is place into the appropriate left interleave in the output code word OUT. [Nazari, column 5, line 61 – column 6, line 2]

Thus, according to Nazari, **bit patterns of subgroups of a code word are compared with bit patterns in a table**. If "bad" values (i.e., coding rule violations) are found in a subgroup, the appropriate bit sequence (from Table B illustrated in FIGURE 2) is substituted for the offending bits in the given subgroup. The resulting thirty-three output code word that is produced according to Nazari then conforms to the coding rules specified by Nazari, i.e., "there should be no more than eleven consecutive logical zeros in the output word OUT, no more than eleven consecutive logical zeros in both odd and even interleaves and a minimum Hamming weight of nine." [Nazari, column 5, lines 41-46]

In complete contrast to Nazari, according to exemplary embodiments of the present invention, initial binary data to be communicated or stored is obtained. The characteristic Hamming weight of the initial binary data is determined. The characteristic Hamming weight of the initial binary data is then compared with a predetermined value. The initial binary data is processed based on the comparison to thereby develop processed binary data having a Hamming weight not less than the characteristic Hamming weight of the initial binary data. The characteristic Hamming weight of the initial binary data preferably is determined by counting one-valued bits in the initial binary data, and the predetermined value preferably is a predetermined minimum Hamming weight threshold value. Processing of the initial binary data can comprise, for example, bitwise inverting of the initial binary data if the Hamming weight of the initial binary data is less than the predetermined value. [*see* present application, page 9 – page 10, paragraphs 0020 – 0021]

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Thus, as understood by Appellants, Nazari teaches that the bit patterns of bits comprising subgroups of a code word are compared with bit patterns in a table. In contrast, exemplary embodiments compare the characteristic Hamming weight of the initial binary data with a predetermined value, and then process the initial binary data based on the comparison (between the characteristic Hamming weight of the initial binary data and the predetermined value) to thereby develop processed binary data having a Hamming weight not less than the characteristic Hamming weight of the initial binary data. It is respectfully submitted that the Patent Office has mischaracterized the comparison performed by the Nazari invention. It is respectfully submitted that the comparison performed by the Nazari invention and the comparison according to exemplary embodiments are **different**. Such a difference is illustrated throughout the Patent Office's many pages of hand calculations.

The Appellants note that the Patent Office asserts that the Appellants "fail to recognize the final outcome of the algorithm." [Answer, page 53] However, it is respectfully submitted that it is the Patent Office that is failing to recognize the individual steps and features of the aforementioned claims of the present application, and, instead, improperly focuses on the "final outcome of the algorithm." The Patent Office is reminded that for 35 U.S.C. §102(e) rejections, it is well known that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) [(emphasis added)].

For at least the foregoing reasons, it is respectfully submitted that Nazari does not anticipate claims 1-3, 24-26, 38-40, 65-67, 88-90, 102-104, 118-120, 155-157 and 171-173, and, therefore, the rejection is improper.

With regard to the rejection of claims 4, 27, 41, 68, 91, 105, 121, 131, 158 and 174, the Patent Office asserts that "when dealing with Binary data replacing a 0 with a 1 or a 1 with a 0 is equivalent to inverting data." [Answer, pages 39 and 75] However, Appellants respectfully submit that nowhere does Nazari teach "bitwise inverting the initial binary data if the Hamming weight of the initial binary data is less than the predetermined value." As noted in the Appeal Brief, the Patent Office seems to be asserting that because one or more of

the bits in the four bit word in Table B, which corresponds to the bad data word found in Table A, happens to be inverted in the corresponding four-bit replacement, this is the same as the Appellants claim feature of the step of "bitwise inverting the initial binary data if the Hamming weight of the initial binary data is less than the predetermined value." It is respectfully submitted that a four bit word that is replaced with a bit word in which one or more of the bits might be inverted is not the same as the Appellants' claim feature "bitwise inverting the initial binary data if the Hamming weight of the initial binary data is less than the predetermined value." Simply asserting that a 0 can be replaced with a 1 and a 1 can be replaced with a 0 cannot replace the lack of teaching in Nazari.

For at least the foregoing reasons, it is respectfully submitted that Nazari does not anticipate claims 4, 27, 41, 68, 91, 105, 121, 131, 158 and 174.

With regard to the rejection of claims 5, 28, 42, 69, 92, 106, 122, 132, 159 and 175, Appellants again assert that Nazari does not teach the feature of processing the initial binary data further comprises supplying an indication of whether the Hamming weight of the initial binary data is less than the predetermined value. As discussed above, it is respectfully submitted that the comparison performed by the Nazari invention and the comparison according to exemplary embodiments are different, as Nazari teaches that the bit patterns of bits comprising subgroups of a code word are compared with bit patterns in a table. For at least the foregoing reasons, Appellants once more respectfully submitted that Nazari does not anticipate claims 5, 28, 42, 69, 92, 106, 122, 132, 159 and 175.

With regard to the rejection of claims 6, 29, 43, 70, 93, 107, 123, 133, 160 and 176, the Patent Office asserts that "OUT(17) is a binary value used to flag violations in the constraints." [Answer, pages 41 and 77] Appellants fail to see – nor does the Patent Office care to point out – how such a feature is the same as the feature of the indication comprises a binary digit having a first value if the Hamming weight of the initial binary data is less than the predetermined value and having a second value otherwise. For at least the foregoing reasons, Appellants again respectfully submit that Nazari does not anticipate claims 6, 29, 43, 70, 93, 107, 123, 133, 160 and 176.

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With regard to the rejection of claims 7, 30, 44, 71, 94, 108, 124, 134, 161 and 177, the Patent Office repeats its assertion that "when dealing with Binary data replacing a 0 with a 1 or a 1 with a 0 is equivalent to inverting data." [Answer, pages 41 and 77] As Appellants noted above, simply asserting that a 0 can be replaced with a 1 and a 1 can be replaced with a 0 cannot replace the lack of teaching in Nazari of the feature of supplying an indication of whether bits of the processed binary data are inverted. For at least the foregoing reasons, Appellants once more respectfully submit that Nazari does not anticipate claims 7, 30, 44, 71, 94, 108, 124, 134, 161 and 177.

With regard to the rejection of claims 8, 31, 45, 72, 95, 109, 125, 135, 162 and 178, the Patent Office again asserts that "when dealing with Binary data replacing a 0 with a 1 or a 1 with a 0 is equivalent to inverting data." [Answer, pages 42 and 78] Again, simply asserting that a 0 can be replaced with a 1 and a 1 can be replaced with a 0 cannot replace the lack of teaching in Nazari of the feature of the indication comprises a binary digit having a first value if the bits of the processed binary data are inverted and having a second value otherwise. For at least the foregoing reasons, Appellants again respectfully submit that Nazari does not anticipate claims 8, 31, 45, 72, 95, 109, 125, 135, 162 and 178.

With regard to the rejection of claims 10, 33, 47, 74, 97, 111, 127, 137, 163 and 180, the Patent Office asserts that "[a] binary digit is a symbol an [sic] the binary digit is both its own end and start point, which never changes regardless of any error correction code." [Answer, pages 42 and 79] It is respectfully submitted that the Patent Office has provided no indication where Nazari teaches the feature of a symbol boundary of an encoded symbol does not change relative to error correction coding, beyond making an unsupported assertion with no relationship to the teachings of Nazari. Therefore, it is respectfully submitted that such a rejection is improper under 35 U.S.C. § 102(e), as the Patent Office has not pointed out where Nazari teaches each and every element of the aforementioned claims. For at least the foregoing reasons, Appellants again respectfully submit that Nazari does not anticipate claims 10, 33, 47, 74, 97, 111, 127, 137, 163 and 180.

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For at least the foregoing reasons, it is respectfully submitted that Nazari does not anticipate the subject matter of claims 1-10, 24-33, 38-47, 65-74, 88-97, 102-111, 118-137, 155-164 and 171-180.

Conclusion

In view of the above, Appellants respectfully submit that the claims of the present application are directed to statutory subject matter under 35 U.S.C. § 101, fully and completely comply with the requirements of 35 U.S.C. § 112, first and second paragraphs, and are not anticipated by Nazari under 35 U.S.C. § 102(e). Any remaining points raised in the Answer are believed to be adequately addressed in Appellants' Appeal Brief.

For the reasons set forth in the Appeal Brief, as well as the additional reasons presented herein, the rejections of the claims are not properly founded in the statute, and should be reversed.

Appellants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 625-3547. All correspondence should continue to be directed to the address given below.

Respectfully submitted,

KATTEN MUCHIN ROSENMAN LLP

By: _____
Andrew J. Bateman
Attorney for Appellants
Registration No. 45,573

IP Docket
Katten Muchin Rosenman LLP
1025 Thomas Jefferson St., NW
East Lobby, Suite 700
Washington, DC 20007-5201
Facsimile No.: (202) 298-7570
Customer No.: 28285

Customer No.: 28285